

IN THE CLAIMS:

1. (Currently Amended) Structure of an An angular pneumatic gripper,
comprising: [.,.]
- a body including a first element and a second element, said first element being
symmetrical and identical to said second element, said first element and said second element
5 being positioned such that said first element is disposed opposite said second element, said
first element and said second element defining a cylindrical cavity within said body;
an angular pneumatic piston for reciprocating moving alternatively in a said
cylindrical cavity of chamber or sleeve in said body[.,.];
- a drive element;
- 10 two [[grips]] gripper elements for gripping and releasing an item, said gripper
elements being supported and guided in [[the]] said body, said gripper elements being
coupled to [[the]] said piston through a via said drive, and two jaws fixed to the grips to
block and release the item to be handled, and where the grips can move said gripper
elements being movable at angles in opposite directions between an open and closed
15 position by means of via said drive element and in response to via movement the alternating
movements of the said piston, characterized by the fact that said body is made up of two
symmetric and identical elements or shells realised and finished individually by forming and
then associated and fixed face to face to form together the housing chamber of said piston
and the said first element and said second element defining a means for receiving and
20 guiding to receive and guide said drive element in a transverse manner and said grips to turn,

25 said first element and said second element elements or shells being formed via made using die-casting, sintering or forging processes, using compatible materials for these forming techniques each element of said body having a support base, an intermediate section element, two shoulder elements and a top crosspiece, each shoulder element being connected to said top crosspiece and said intermediate section element, said intermediate section of each element centrally forming said cylindrical cavity, said cylindrical cavity having an open end and a closed end, said open end of said cylindrical cavity of said first element being opposite said open end of said cylindrical cavity of said second element, said first element and said second element having a top wall, two housing elements and a sliding surface, said top wall, said two housing elements and said sliding surface defining a chamber having a first opening on one side and a second opening on another side, one housing element being opposite another housing element, said first opening of said first element being opposite said first opening of said second element, said sliding surface being positioned parallel above said cylindrical cavity and having a half-slot located at a side of said first opening, said intermediate section defining holes for receiving fasteners, said holes being adjacent said cylindrical cavity and extending parallel to said cylindrical cavity, said first element being fixed to said second element such that said chamber of said first element and said chamber of said second element form a drive receiving chamber and said cylindrical cavity of said first element and said cylindrical cavity of said second element form a piston receiving chamber and said half-slot of said first element and said half-slot of said second element form a full slot, said drive element engaging said sliding surface of said first element

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and said second element, said drive element being connected to said piston via a through pin, said through pin extending through said full slot, one gripper element extending through said second opening of said first element, another gripper element extending through said second opening of said second element, whereby a portion of each gripper element is located within said drive receiving chamber.

2. (Cancelled)

3. (Currently Amended) Structure of an An angular pneumatic chuck according to claim 1, further comprising:

a first geared wheel;

a second geared wheel;

a support element defining a receiving hole, wherein each gripper element has a lower cylindrical section, said lower cylindrical section defining crossed by a polygonal hole, said lower cylindrical section being [[and]] coupled to said first geared wheel and said second geared wheel two geared wheels, said first geared wheel being located on one side of said lower cylindrical section and said second geared wheel being located on another side of said lower cylindrical section one per side, each geared wheel [[one]] having, on one side; a polygonal hub on one side, said polygonal hole receiving said polygonal hub to house and fit into the transverse polygonal hole of the grip and, from the opposite side, each geared wheel having a cylindrical hub on another side, said receiving hole of said support hole receiving

15 said cylindrical hub to house and turn in a corresponding housing shaped in a support element, [[the]] said first geared wheel and said second geared wheel geared wheels being attached to their respective grip by one of said gripper elements via a bolt passing extending through the hubs of the geared wheels, said bolt [[and]] forming an axis of [[the]] rotation axis of the gripper element, said support element supporting and said support being equipped to support the collateral gear wheels of the two grips of the gripper elements.

4. (Currently Amended) Structure of an An angular pneumatic gripper according to claim 3, wherein [[the]] said drive element has a pair of indexing racks, each indexing rack engaging said first geared wheel and said second geared wheel of one of said meshed with the opposite geared wheels of one of the grips gripper elements, said first geared wheel of one gripper element engaging said first gear wheel of another gripper element, said second geared wheel of said one gripper element engaging said second geared wheel of said another gripper element themselves meshed with the geared wheels of the other grip.

5. (Currently Amended) Structure of an An angular pneumatic [[chuck]] gripper according to claim 3, further comprising a protective cap located wherein on the side of each geared wheel on the side of the polygonal hub, which is coupled to the grip and neck is formed to which a protective cap is associated, said cap having flanges located at [[the]] a top center portion thereof and at the bottom ends thereof having some overhangs facing towards the grips, said flanges facing opposite said gripper elements, [[the]] said protective

cap engaging at the same time the neck of said first geared wheel of one gripper element and
said first geared wheel of another gripper element, said flanges of one protective cap located
on one side of said gripper elements engaging said flanges of another protective cap located
10 on another side of said gripper elements the collateral geared wheels of the two grips and
the relative overhangs, matching the homologous overhangs of the cap associated with the
geared wheels on the opposite part of the grips and acting as scrapers for the external
surface of the cylindrical portion of said grips.

6. (Currently Amended) Structure of an An angular pneumatic [[chuck]] gripper
according to claim 1, wherein each element has a support base and an intermediate section,
said support base having two lugs, one lug being located on one side of said support base
and another lug being located on another side of said support base, each lug defining a half-
5 hole for receiving in which on the sides of the support base of each shell of the body two
lugs with half-holes for anchoring screws, said are formed and on the sides of the
intermediate section defining of each shell longitudinal grooves for applying accessories, one
longitudinal groove extending along one side of said intermediate section and another
longitudinal groove extending along another side of said intermediate section are provided.

7 - 8. (Canceled)

9. (Currently Amended) Structure of an An angular pneumatic [[chuck]] gripper

according to claim 3, wherein each element has a support base and an intermediate section,
said support base having two lugs, one lug being located on one side of said support base
and another lug being located on another side of said support base, each lug defining a half-
5 hole for receiving in which on the sides of the support base of each shell of the body two
lugs with half-holes for anchoring screws, said are formed and on the sides of the
intermediate section defining of each shell longitudinal grooves for applying accessories, one
longitudinal groove extending along one side of said intermediate section and another
longitudinal groove extending along another side of said intermediate section are provided.

10. (Currently Amended) Structure of an An angular pneumatic [[chuck]] gripper
according to claim 4, wherein each element has a support base and an intermediate section,
said support base having two lugs, one lug being located on one side of said support base
and another lug being located on another side of said support base, each lug defining a half-
5 hole for receiving in which on the sides of the support base of each shell of the body two
lugs with half-holes for anchoring screws, said are formed and on the sides of the
intermediate section defining of each shell longitudinal grooves for applying accessories, one
longitudinal groove extending along one side of said intermediate section and another
longitudinal groove extending along another side of said intermediate section are provided.

11. (Currently Amended) Structure of an An angular pneumatic [[chuck]] gripper
according to claim 5, wherein each element has a support base and an intermediate section,

said support base having two lugs, one lug being located on one side of said support base
and another lug being located on another side of said support base, each lug defining a half-
5 hole for receiving in which on the sides of the support base of each shell of the body two
lugs with half-holes for anchoring screws, said are formed and on the sides of the
intermediate section defining of each shell longitudinal grooves for applying accessories, one
longitudinal groove extending along one side of said intermediate section and another
longitudinal groove extending along another side of said intermediate section are provided.

12. (New) An angular pneumatic gripper, comprising:

a body including a first element and a second element, said first element being symmetrical and identical to said second element, said first element and said second element being positioned such that said first element is disposed opposite said second element, said
5 first element and said second element defining a cavity within said body;

an angular pneumatic piston for reciprocating in said cavity of said body;
a drive element;
two gripper elements for gripping and releasing an item, said gripper elements being supported and guided in said body, said gripper elements being coupled to said piston via
10 said drive, said gripper elements being movable at angles in opposite directions between an open and closed position via said drive element and via reciprocating movements of said piston, said first element and said second element defining a means for receiving and guiding said drive element, said first element and said second element being formed via die-casting,

sintering or forging processes

15 a first geared wheel;

 a second geared wheel;

 a support element defining a receiving hole, wherein each gripper element has a lower cylindrical section, said lower cylindrical section defining a polygonal hole, said lower cylindrical section being coupled to said first geared wheel and said second geared wheel,

20 said first geared wheel being located on one side of said lower cylindrical section and said second geared wheel being located on another side of said lower cylindrical section, each geared wheel having a polygonal hub on one side, said polygonal hole receiving said polygonal hub, each geared wheel having a cylindrical hub on another side, said receiving hole of said support hole receiving said cylindrical hub, said first geared wheel and said second geared wheel being attached to one of said gripper elements via a bolt extending through the hubs of the geared wheels, said bolt forming an axis of rotation of the gripper element, said support element supporting collateral geared wheels of the two gripper elements.

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13. (New) An angular pneumatic gripper, comprising:

 a body including a first element and a second element, said first element being symmetrical and identical to said second element, said first element and said second element being positioned such that said first element is disposed opposite said second element, said first element and said second element defining a cavity within said body;

an angular pneumatic piston for reciprocating in said cavity of said body;

a drive element;

two gripper elements for gripping and releasing an item, said gripper elements being supported and guided in said body, said gripper elements being coupled to said piston via
10 said drive, said gripper elements being movable at angles in opposite directions between an open and closed position via said drive element and via movement of said piston, said first element and said second element defining a means for receiving and guiding said drive element, said first element and said second element being formed via die-casting, sintering or forging processes

15 a first geared wheel;

a second geared wheel;

a support element defining a receiving hole, wherein each gripper element has a lower cylindrical section, said lower cylindrical section defining a polygonal hole, said lower cylindrical section being coupled to said first geared wheel and said second geared wheel,
20 said first geared wheel being located on one side of said lower cylindrical section and said second geared wheel being located on another side of said lower cylindrical section, each geared wheel having a polygonal hub on one side, said polygonal hole receiving said polygonal hub, each geared wheel having a cylindrical hub on another side, said receiving hole of said support hole receiving said cylindrical hub, said first geared wheel and said second geared wheel being attached to one of said gripper elements via a bolt extending through the hubs of the geared wheels, said bolt forming an axis of rotation of the gripper
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element, said support element supporting collateral geared wheels of the two gripper elements, said drive element having a pair of indexing racks, each indexing rack engaging said first geared wheel and said second geared wheel of one of said gripper elements, said
30 first geared wheel of one gripper element engaging said first gear wheel of another gripper element, said second geared wheel of said one gripper element engaging said second geared wheel of said another gripper element.

14. (New) An angular pneumatic gripper, comprising:

a body including a first element and a second element, said first element being symmetrical and identical to said second element, said first element and said second element being positioned such that said first element is disposed opposite said second element, said
5 first element and said second element defining a cavity within said body;

an angular pneumatic piston for reciprocating in said cavity of said body;

a drive element;

two gripper elements for gripping and releasing an item, said gripper elements being supported and guided in said body, said gripper elements being coupled to said piston via
10 said drive, said gripper elements being movable at angles in opposite directions between an open and closed position via said drive element and via movement of said piston, said first element and said second element defining a means for receiving and guiding said drive element, said first element and said second element being formed via die-casting, sintering or forging processes

15 a first geared wheel;

 a second geared wheel;

 a support element defining a receiving hole, wherein each gripper element has a lower cylindrical section, said lower cylindrical section defining a polygonal hole, said lower cylindrical section being coupled to said first geared wheel and said second geared wheel,

20 said first geared wheel being located on one side of said lower cylindrical section and said second geared wheel being located on another side of said lower cylindrical section, each geared wheel having a polygonal hub on one side, said polygonal hole receiving said polygonal hub, each geared wheel having a cylindrical hub on another side, said receiving hole of said support hole receiving said cylindrical hub, said first geared wheel and said

25 second geared wheel being attached to one of said gripper elements via a bolt extending through the hubs of the geared wheels, said bolt forming an axis of rotation of the gripper element, said support element supporting collateral geared wheels of the two gripper elements;

 a protective cap located on the side of each geared wheel on the side of the

30 polygonal hub, said cap having flanges located at a top center portion thereof and at the bottom ends thereof, said flanges facing opposite said gripper elements, said protective cap engaging said first geared wheel of one gripper element and said first geared wheel of another gripper element, said flanges of one protective cap located on one side of said gripper elements engaging said flanges of another protective cap located on another side of

35 said gripper elements.

15. (New) An angular pneumatic gripper, comprising:

a body including a first element and a second element, said first element being symmetrical and identical to said second element, said first element and said second element being positioned such that said first element is disposed opposite said second element, said

5 first element and said second element defining a cylindrical cavity within said body;

an angular pneumatic piston reciprocating in said cylindrical cavity of said body;

a drive element;

two gripper elements for gripping and releasing an item, said gripper elements being supported and guided in said body, said gripper elements being coupled to said piston via

10 said drive, said gripper elements being movable at angles in opposite directions between an open and closed position via said drive element and via movement of said piston, said first element and said second element defining a means for receiving and guiding said drive element, said first element and said second element being formed via die-casting, sintering or forging processes, each element of said body having a support base, an intermediate section

15 element, two shoulder elements and a top crosspiece, each shoulder element being

connected to said top crosspiece and said intermediate section element, said intermediate section of each element centrally forming said cylindrical cavity, said cylindrical cavity

having an open end and a closed end, said open end of said cylindrical cavity of said first element being opposite said open end of said cylindrical cavity of said second element, said

20 first element and said second element having a top wall, two housing elements and a sliding

surface, said top wall, said two housing elements and said sliding surface defining a chamber having a first opening on one side and a second opening on another side, one housing element being opposite another housing element, said first opening of said first element being opposite said first opening of said second element, said sliding surface being positioned parallel above said cylindrical cavity and having a half-slot located at a side of said first opening, said intermediate section defining holes for receiving fasteners, said holes being adjacent said cylindrical cavity and extending parallel to said cylindrical cavity, said first element being fixed to said second element such that said chamber of said first element and said chamber of said second element form a drive receiving chamber and said cylindrical cavity of said first element and said cylindrical cavity of said second element form a piston receiving chamber and said half-slot of first element and said half-slot of said second element form a full slot, said drive element engaging said sliding surface of said first element and said second element, said drive element being connected to said piston via a through pin, said through pin extending through said full slot, one gripper element extending through said second opening of said first element, another gripper element extending through said opening of said second element, whereby a portion of each gripper element is located within said drive receiving chamber;

a first geared wheel;

a second geared wheel;

40 a support element defining a receiving hole, wherein each gripper element has a lower cylindrical section, said lower cylindrical section defining a polygonal hole, said lower

cylindrical section being coupled to said first geared wheel and said second geared wheel,
said first geared wheel being located on one side of said lower cylindrical section and said
second geared wheel being located on another side of said lower cylindrical section, each
45 geared wheel having a polygonal hub on one side, said polygonal hole receiving said
polygonal hub, each geared wheel having a cylindrical hub on another side, said receiving
hole of said support hole receiving said cylindrical hub, said first geared wheel and said
second geared wheel being attached to one of said gripper elements via a bolt extending
through the hubs of the geared wheels, said bolt forming an axis of rotation of the gripper
50 element, said support element supporting collateral geared wheels of the two gripper
elements.

16. (New) An angular pneumatic gripper, comprising:

a body including a first element and a second element, said first element being
symmetrical and identical to said second element, said first element and said second element
being positioned such that said first element is disposed opposite said second element, said
5 first element and said second element defining a cylindrical cavity within said body, each
element having a support base and an intermediate section, said support base having two
lugs, one lug being located on one side of said support base and another lug being located
on another side of said support base, each lug defining a half-hole for receiving anchoring
fasteners, said intermediate section defining longitudinal grooves for applying accessories,
10 one longitudinal groove extending along one side of said intermediate section and another

longitudinal groove extending along another side of said intermediate section;

an angular pneumatic piston for reciprocating in said cylindrical cavity of said body;

a drive element;

two gripper elements for gripping and releasing an item, said gripper elements being supported and guided in said body, said gripper elements being coupled to said piston via said drive, said gripper elements being movable at angles in opposite directions between an open and closed position via said drive element and via movement of said piston, said first element and said second element defining a means for receiving and guiding said drive element, said first element and said second element being formed via die-casting, sintering or forging processes, each element of said body having a support base, an intermediate section element, two shoulder elements and a top crosspiece, each shoulder element being connected to said top crosspiece and said intermediate section element, said intermediate section of each element centrally forming said cylindrical cavity, said cylindrical cavity having an open end and a closed end, said open end of said cylindrical cavity of said first element being opposite said open end of said cylindrical cavity of said second element, said first element and said second element having a top wall, two housing elements and a sliding surface, said top wall, said two housing elements and said sliding surface defining a chamber having a first opening on one side and a second opening on another side, one housing element being opposite another housing element, said first opening of said first element being opposite said first opening of said second element, said sliding surface being positioned parallel above said cylindrical cavity and having a half-slot located at a side of

35 said first opening, said intermediate section defining holes for receiving fasteners, said holes being adjacent said cylindrical cavity and extending parallel to said cylindrical cavity, said first element being fixed to said second element such that said chamber of said first element and said chamber of said second element form a drive receiving chamber and said cylindrical cavity of said first element and said cylindrical cavity of said second element form a piston receiving chamber and said half-slot of first element and said half-slot of said second element form a full slot, said drive element engaging said sliding surface of said first element and said second element, said drive element being connected to said piston via a through pin, said
40 through pin extending through said full slot, one gripper element extending through said second opening of said first element, another gripper element extending through said second opening of said second element, whereby a portion of each gripper element is located within said drive receiving chamber.

17. (New) An angular pneumatic gripper, comprising:

a body including a first element and a second element, said first element being symmetrical and identical to said second element, said first element and said second element being positioned such that said first element is disposed opposite said second element, said first element and said second element defining a cavity within said body, each element having a support base and an intermediate section, said support base having two lugs, one lug being located on one side of said support base and another lug being located on another side of said support base, each lug defining a half-hole for receiving anchoring fasteners, said

intermediate section defining longitudinal grooves for applying accessories, one longitudinal
10 groove extending along one side of said intermediate section and another longitudinal
groove extending along another side of said intermediate section;

an angular pneumatic piston for reciprocating in said cavity of said body;

a drive element;

two gripper elements for gripping and releasing an item, said gripper elements being
15 supported and guided in said body, said gripper elements being coupled to said piston via
said drive, said gripper elements being movable at angles in opposite directions between an
open and closed position via said drive element and via movement of said piston, said first
element and said second element defining a means for receiving and guiding said drive
element, said first element and said second element being formed via die-casting, sintering or
20 forging processes

a first geared wheel;

a second geared wheel;

a support element defining a receiving hole, wherein each gripper element has a
lower cylindrical section, said lower cylindrical section defining a polygonal hole, said lower
25 cylindrical section being coupled to said first geared wheel and said second geared wheel,
said first geared wheel being located on one side of said lower cylindrical section and said
second geared wheel being located on another side of said lower cylindrical section, each
geared wheel having a polygonal hub on one side, said polygonal hole receiving said
polygonal hub, each geared wheel having a cylindrical hub on another side, said receiving

30 hole of said support hole receiving said cylindrical hub, said first geared wheel and said second geared wheel being attached to one of said gripper elements via a bolt extending through the hubs of the geared wheels, said bolt forming an axis of rotation of the gripper element, said support element supporting collateral geared wheels of the two gripper elements.

18. (New) An angular pneumatic gripper, comprising:

a body including a first element and a second element, said first element being symmetrical and identical to said second element, said first element and said second element being positioned such that said first element is disposed opposite said second element, said 5 first element and said second element defining a cavity within said body, each element having a support base and an intermediate section, said support base having two lugs, one lug being located on one side of said support base and another lug being located on another side of said support base, each lug defining a half-hole for receiving anchoring fasteners, said intermediate section defining longitudinal grooves for applying accessories, one longitudinal groove extending along one side of said intermediate section and another longitudinal groove extending along another side of said intermediate section;

10 an angular pneumatic piston for reciprocating in said cavity of said body;

a drive element;

15 two gripper elements for gripping and releasing an item, said gripper elements being supported and guided in said body, said gripper elements being coupled to said piston via

said drive, said gripper elements being movable at angles in opposite directions between an open and closed position via said drive element and via movement of said piston, said first element and said second element defining a means for receiving and guiding said drive element, said first element and said second element being formed via die-casting, sintering or

20 forging processes

a first geared wheel;

a second geared wheel;

a support element defining a receiving hole, wherein each gripper element has a lower cylindrical section, said lower cylindrical section defining a polygonal hole, said lower

25 cylindrical section being coupled to said first geared wheel and said second geared wheel, said first geared wheel being located on one side of said lower cylindrical section and said second geared wheel being located on another side of said lower cylindrical section, each geared wheel having a polygonal hub on one side, said polygonal hole receiving said

polyangular hub, each geared wheel having a cylindrical hub on another side, said receiving

30 hole of said support hole receiving said cylindrical hub, said first geared wheel and said second geared wheel being attached to one of said gripper elements via a bolt extending through the hubs of the geared wheels, said bolt forming an axis of rotation of the gripper element, said support element supporting collateral geared wheels of the two gripper

elements, said drive element having a pair of indexing racks, each indexing rack engaging

35 said first geared wheel and said second geared wheel of one of said gripper elements, said first geared wheel of one gripper element engaging said first gear wheel of another gripper

element, said second geared wheel of said one gripper element engaging said second geared wheel of said another gripper element.

19. (New) An angular pneumatic gripper, comprising:

a body including a first element and a second element, said first element being symmetrical and identical to said second element, said first element and said second element being positioned such that said first element is disposed opposite said second element, said

5 first element and said second element defining a cavity within said body, each element having a support base and an intermediate section, said support base having two lugs, one lug being located on one side of said support base and another lug being located on another side of said support base, each lug defining a half-hole for receiving anchoring fasteners, said intermediate section defining longitudinal grooves for applying accessories, one longitudinal groove extending along one side of said intermediate section and another longitudinal groove extending along another side of said intermediate section;

10 an angular pneumatic piston for reciprocating in said cavity of said body;

a drive element;

15 two gripper elements for gripping and releasing an item, said gripper elements being supported and guided in said body, said gripper elements being coupled to said piston via said drive, said gripper elements being movable at angles in opposite directions between an open and closed position via said drive element and via movement of said piston, said first element and said second element defining a means for receiving and guiding said drive

element, said first element and said second element being formed via die-casting, sintering or

20 forging processes

a first geared wheel;

a second geared wheel;

a support element defining a receiving hole, wherein each gripper element has a lower cylindrical section, said lower cylindrical section defining a polygonal hole, said lower

25 cylindrical section being coupled to said first geared wheel and said second geared wheel,

said first geared wheel being located on one side of said lower cylindrical section and said second geared wheel being located on another side of said lower cylindrical section, each geared wheel having a polygonal hub on one side, said polygonal hole receiving said

polyangular hub, each geared wheel having a cylindrical hub on another side, said receiving

30 hole of said support hole receiving said cylindrical hub, said first geared wheel and said

second geared wheel being attached to one of said gripper elements via a bolt extending through the hubs of the geared wheels, said bolt forming an axis of rotation of the gripper element, said support element supporting collateral geared wheels of the two gripper elements;

35 a protective cap located on the side of each geared wheel on the side of the polygonal hub, said cap having flanges located at a top center portion thereof and at the bottom ends thereof, said flanges facing opposite said gripper elements, said protective cap engaging said first geared wheel of one gripper element and said first geared wheel of another gripper element, said flanges of one protective cap located on one side of said

40 gripper elements engaging said flanges of another protective cap located on another side of
said gripper elements.